The author, from his position as Medical Director for the province of Sémiretchie, where the Kirghis population numbers more than 550,000, has had exceptional opportunities for observing the social and domestic habits of the people; and his carefully-conducted craniometric and other measurements, together with his exhaustive remarks on the physical, moral, and intellectual characteristics of the people, their language and literature, religion and superstitions, and the past and probable future effects on the race of closer contact with Western civilisation, supply valuable materials towards the history of these ancient tribes, whose numbers are computed at upwards of a million and a half.—On the so-called cup-like excavations, "Pierres à Cupules," by M. de Nadaillac. The author passes in review the most remarkable of these stone-markings, which have been found in the most widely-separated parts of the globe since they first attracted notice in Switzerland in 1849. In Brittany, where such stone-markings and depressions have of late years been found in great numbers, they appear to be contemporaneous with the dolmen age. M. de Nadaillac is of opinion that the general similarity of the markings, of which he gives various clear drawings, cannot be accepted as a proof of any ethnic connection between the various peoples who designed them, and is probably only to be referred to a general similarity of intelligence among men at one and the same stage of their respective courses of development.—Contributions to the history of muscular anomalies, by M. Ledouble. In the present paper, which is a sequel to the author's articles in last year's *Revue* on the major and minor pectorals, he treats specially of the variations of length and breadth in the abdominal muscles, considering each anomaly from a comparative anatomical point of view.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, January 28.—"On the Development of the Cranial Nerves of the Newt." By Alice Johnson, Demonstrator of Biology, Newnham College, Cambridge, and Lilian Sheldon, Bathurst Student, Newnham College, Cambridge. Communicated by Prof. M. Foster, Sec. R.S.

February 25.—"On Radiant Matter Spectroscopy: Note on the Earth Yα." By William Crookes, F.R.S.

Among the samarskite earths which concentrate towards the middle of the fractionations there is one (or a group) which presents in the radiant matter tube a well-marked phosphorescent spectrum differing from those I have already described.

The measurements of the bands and lines are given below:—

Scale of spectroscope	λ	$\frac{1}{\lambda^2}$	Remarks
10°325	6446	2407	Approximate centre of a red band shaded off on the least refrangible side.
10·310	6415	2430	Somewhat sharp edge of the red band.
10·185	6189	2611	Approximate centre of a very faint orange band.
10·130	6094	2693	A sharp narrow orange-red line.
10·05	5970	2806	Approximate centre of a narrow bright orange band. (Between this line and 2693 is a fainter semi-continuous orange band).
9·840	5676	3104	Approximate centre of a narrow bright green band.
9·790	5613	3174	Approximate centre of a narrow green band, not quite so bright as 3104.
9·690	5495	3312	Approximate centre of a bright green band, wider than the other three green bands.
9 610	5406	3422	Approximate centre of a narrow bright green band.

The earth giving the above spectrum, when sufficiently purified, presents all the characteristics of the earth discovered by Marignac, and provisionally called by him Yα (*Comptes rendus*, xc. p. 899). Through the kindness of M. de Marignac I have been enabled to compare a specimen of Yα of his own preparation with the earth described above. The two earths agree in their chemical characteristics, and their phosphorescent spectra are practically identical.

No name has yet been given to this earth, as the discoverer appears to be in some doubt whether it is not identical with J. Lawrence Smith's earth mosandra (*Comptes rendus*, lxxxvii. p. 145; lxxxvii. p. 831; lxxxix. p. 480). A specimen of mosandra prepared by J. Lawrence Smith, and sent me by M. de Marignac, gave a phosphorescent spectrum showing that it was compound, and that yttria was one of its constituents.

"On a Comparison between Apparent Inequalities of Short Period in Sunspot Areas and in Diurnal Declination Ranges at Toronto and at Prague." By Prof. Balfour Stewart, F.R.S., and William Lant Carpenter, B.A., B.Sc.

The authors discuss these inequalities in precisely the same manner in which they discussed those of a previous communication (*Proc.* Roy. Soc., vol. xxxvii. p. 290), and are led to the following conclusions:—

(α) When disturbances are excluded as much as possible, both the Toronto and the Prague declination inequalities exhibit signs of duplicity of phase, the predominant maximum at both observatories occurring shortly after the sunspot maximum for inequalities around twenty-four days.

(β) On the other hand, for inequalities around twenty-six days the predominant maximum for both observatories more nearly coincides in time with the subsidiary maximum of the twenty-four day inequalities.

(γ) The short-period inequalities of this paper are as nearly as possible equally developed and equally traceable for temperature and for declination ranges.

(δ) When disturbances are excluded as much as possible, corresponding phases appear to take place at Toronto three or four days before they take place at Prague.

March 4.—The Bakerian Lecture.—"Colour Photometry." By Capt. W. de W. Abney, F.R.S., and Major-Gen. Festing, R.E.

One of the authors of this paper has already communicated to the Physical Society of London (*Phil. Mag.* 1885) a method by which a patch of monochromatic light can be thrown on a screen. This formed the starting-point of the present investigation, which was to ascertain whether it was practicable to compare with each other the intensity of lights of different colours.

The authors describe various plans they adopted to effect this purpose, and finally found that, by placing a rod in front of the patch of monochromatic light, and by casting another shadow by means of a candle alongside the first shadow, the intensities of the two lights which illuminated the two shadows could be compared by what they term an oscillation method. It is known that on each side of the yellow of the spectrum the luminosity more or less rapidly decreases. By placing a candle at such a distance from the screen that the luminosity of the two shadows appears as approximately equal, it is easy to oscillate the card carrying the slit through which the monochromatic rays of the spectrum pass. (The slit is in the focus of the lens which helps to form the spectrum.) The shadow of the rod cast by the candle can thus be made to appear alternately "too light" or "too dark" in comparison with the shadow of the rod cast by the parts of the spectrum falling on the screen. By a moderately rapid oscillation the position of equality of the two shadows can be distinguished with great exactness. The authors describe their method of fixing the position of the rays employed and the source of light with which the spectrum is formed. They also enter into details as to the comparison light, the receiving screen, and the comparative value of the light as seen by them respectively. The curve of the intensity of the spectrum of the light emitted from the positive pole of the arc light as seen by their eyes, which they call the normal curve, is then described. The question as to the effect of an alteration of the colour of the comparison light is then discussed, as is the effect of the brightness of the spectrum.

The next point touched upon is as to the value of mixed light as compared with its components. It is found that the following law holds good, viz.: *that "the sum of the intensities of two or more colours is equal to the intensity of the same rays when mixed."* This law is applied to Hering's theory of colour.

The authors next state that with the majority of people the curve of luminosity of the spectrum is identical with the normal curve, but that in some cases slight differences may be observed, of which one example is given. Such slight deficiency does not

constitute colour-blindness, since the want of appreciation of any colour is but very partial. They next describe observations made by four colour-blind persons, and show that there is a remarkable divergence in their curves from the normal. The deficiency curves are shown, from which it appears that two of the observers are totally blind to red, whilst the other two are partially so. They then show that such observers would not give a true value for any light which is not of identically the same colour as the comparison light they might employ. It also appears that the intensity of illumination felt by a colour-blind is really less than that perceived by a normal-eyed person.

Two examples of the curves for sunlight are then given, one taken on a day in July by the method of separating close lines by varying the illumination, and the other in November by the method described above. Their results are compared with Vierordt's curve, obtained by extinguishing colour with white light.

In order to ascertain the effect of the turbidity of a medium through which light passes (for instance, of air on sunlight), the authors compared the intensity of the spectrum after passing through clear water and turbid water, and found that the absorption agreed with Lord Rayleigh's theoretical deductions that

$$I' = I_0 \epsilon^{-kx\lambda^{-4}},$$

where I' is the intensity after passing through a turbid medium, I_0 the intensity after passing through clear water, x the thickness of the turbid layer, k a constant independent of λ, λ being the wave-length.

The authors conclude their paper with a discussion of the intensity curves of the spectrum of carbon filaments electrically heated.

Chemical Society, February 18.—Dr. Hugo Müller, F.R.S., President, in the chair.—The following papers were read :—The constitution of undecylenic acid as indicated by its magnetic rotation ; and on the magnetic rotation, &c., of mono- and di-allylacetic acids and ethylic diallylmalonate, by W. H. Perkin, F.R.S.—Reactions supposed to yield nitroxyl or nitryl chloride, by W. Collingwood Williams, B.Sc.—The condition of silicon in cast iron, by A. E. Jordan and Thomas Turner.—Certain aromatic cyanates and carbamates, by H. Lloyd Snape, B.Sc.—The oil obtained from lime-leaves, by Francis Watts.

March 4.—Dr. Hugo Müller, F.R.S., President, in the chair.—A new element: germanium, by Clemens Winkler.—The influence of temperature on the heat of chemical combination, by S. U. Pickering.—The salts of tetrethylphosphonium and their decomposition by heat, by Prof. E. A. Letts and Norman Collie, Ph.D.—The formation of acids from aldehydes by the action of anhydrides and salts, and the formation of ketones from the compounds resulting from the union of anhydrides and salts, by W. H. Perkin, F.R.S.—A new method of preparing tin tetrethide, by Prof. E. A. Letts and Norman Collie, Ph.D.—Contributions to the history of cyanuric chloride, by Alfred Senier, M.D.—The action of naphthylamine on cyanuric chloride, by Harold H. Fries.—Sulphine salts containing the ethylene radicle; part i., diethylenesulphide-methyl-sulphine salts, by Orme Masson, M.A., D.Sc.—Sulphine salts containing the ethylene radicle ; part ii., on Dehn's reaction between ethylene bromide and alkyl sulphide, by Orme Masson, M.A., D.Sc.

Zoological Society, March 16.—Prof. W. H. Flower, F.R.S., President, in the chair.—Mr. F. D. Godman, F.R.S., exhibited some examples of a butterfly, *Danais plexippus*, from various localities, and made remarks on its distribution, which of late years seemed to have become very widely extended.—Prof. Bell made some remarks on the *Balanoglossus* recently discovered in the Island of Herm, Channel Islands, of which he had exhibited a specimen on a former occasion.—A communication was read from the Rev. H. S. Gorman, F.Z.S., containing descriptions of some new genera and species of Coleoptera of the family Endomychidæ from various localities.—A communication was read from Dr. R. J. Anderson, F.Z.S., of Queen's College, Galway, containing observations on the pelvisternum in certain Vertebrates.—Prof. F. Jeffrey Bell read a paper on the generic characters of Planarians, basing his observations mainly on a specimen of a Planarian recently found living in this country, and believed to be referable to *Bipalium kewense*.—Mr. F. E. Beddard read a note on the structure of a large species of earthworm from New Caledonia, of which examples had been recently received from Mr. E. L. Layard, F.Z.S., H.B.M. Consul for New Caledonia.

Physical Society, March 13.—Prof. Balfour Stewart, President, in the chair.—Prof. U. S. Pickering and A. C. Hayward were elected Members of the Society.—The following communications were read :—On the growth of filiform silver, by Dr. J. H. Gladstone. It has long been known that if a piece of metallic copper be placed in a solution of nitrate of silver, replacement of one metal by the other will take place, the silver being deposited in the crystalline form, sometimes having a resemblance to fern-leaves, or as superposed hexagonal plates, or knobs. It was observed, however, as far back as 1872, by the late Mr. Tribe and the author, that if nitrate of silver were decomposed by suboxide of copper instead of the metal, the silver presented itself in threads, which rarely, if ever, bifurcate, but frequently turn at sharp angles or twist in every direction. This was described in the British Association *Report* for 1872, and it was observed that the same forms occurred in native silver. More recent observations have shown that the particular character and rapidity of formation of these threads depend very much upon the strength of the solution and the condition of the suboxide. Hydrated suboxide will scarcely decompose a 2 per cent. solution, even after standing. The threads, which bend at a sharp angle, usually do so at 60° or 120°. Other threads, however, are symmetrically curved ; but, especially in strong solutions, they are given to twisting about in every direction, and generally terminate in irregular knobs of silver. As a rule a thread continues to grow of the same thickness as it commenced, but it sometimes enlarges for a while into a flat plane, or becomes incrusted for some distance with small crystals of silver. When the solution is very nearly exhausted of silver, fine arborescent forms appear ; but with the suboxide there are never produced the fern-leaved forms, or hexagonal plates, or the other distinctly crystalline structures which characterise the growth from metallic copper. During the reaction the suboxide is changed into black protoxide and metallic copper, which dissolves ; and the change will take place as well with the acetate and sulphate as the nitrate. If a mixture of suboxide and metallic copper be employed, not only do the distinctly crystalline and the filiform forms make their appearance, but strange intermediate forms come into existence.—Apparatus for measuring the electrical resistance of liquids, by Prof. Reinold. The apparatus consists of two bottles connected by a horizontal tube. The whole is filled with the liquid to be examined, and immersed in water, by which means, and by thermometers inserted in each bottle, the temperature may be regulated and accurately ascertained. The electrodes are platinum plates, one dipping into each bottle. Two fine tubes terminate near the ends of the connecting-tube, and electrodes are fitted into them at some distance from the ends ; by connecting these to a quadrant electrometer or a condenser and galvanometer, the difference of potential between the ends of the tube can be compared with that at the ends of a known resistance in the same circuit.—On chromatic photometry, by Capt. Abney and Lieut.-Col. R. Festing. (This paper had been previously communicated to the Royal Society.) A series of experiments have been made by the authors to determine the comparative luminous effect of different parts of the spectrum. A monochromatic light from any part of the spectrum of the electric arc was obtained by a method devised by Capt. Abney, and previously described by him to the Society [Physical Society, June 27, 1885, NATURE, vol. xxxii. p. 263]. The photometric effect at different parts of the spectrum was compared with that due to a candle at different distances by Rumford's photometer. In using this it was found best to place the candle in a given position, and obtain a balance by moving the slide upon which the spectrum was formed, and through a slit in which part of the light was allowed to pass rapidly to and fro. For each position of the candle there are thus two corresponding positions of the slit. From the results of these observations a curve may be drawn, showing the luminosity at different points. From the method by which it is obtained it is evident that the curve of one observer is not directly comparable with that of another, since a deficiency of perception in any part of the spectrum would affect the light of the candle as well as that examined. Since, however, the curves obtained by a great number of persons coincide very closely with those obtained by the authors, they have felt justified in adopting them as the normal curves. In the case of the electric arc the normal curve attains a maximum rather nearer the red end of the spectrum than the blue. Assuming the normal curve, any other curve may be compared with it by increasing or decreasing its

ordinates, so that no part of it shall lie without the normal curve. In curves thus obtained, several of which were shown, deficiency in colour-perception is often very clearly marked. By the use or two or more slits in the movable slide, experiments were made upon mixtures of colours, and it was found in all cases that the luminous effect of a mixture of colours was the sum of the luminous effects of its components. It was also found that the colour of the comparison and the quantity of light admitted to form the spectrum were without effect upon the form of the curve. Light from the sun and from an incandescent lamp were similarly examined, though it should be observed that the result for sunlight differs notably from that given by Maxwell. An examination has also been made of light after passing through a turbid medium, and an expression of Lord Rayleigh's—

$$I' = Ie^{-x\lambda^{-4}},$$

where I is the original radiation, I' that after passing through the medium, λ the wave-length of the light, and x a constant depending upon the medium, has been closely verified.

Royal Microscopical Society, March 10.—Rev. Dr. Dallinger, President, F.R.S., in the chair.—Mr. J. Beck described his recent visit to the Naples Zoological Station, and exhibited some Tubularia and other organisms with expanded tentacles.—Dr. Crookshank exhibited an elaborate micro-photographic apparatus by Messrs. Swift.—Mr. Crisp exhibited Helmholtz's vibration-microscope for observing the vibration of tuning-forks, strings, and other bodies, Thoma's microscope for examining the circulation of the blood in the mesentery of dogs and other small mammals, and various other microscopes and apparatus, including Prof. Exner's new micro-refractometer for detecting differences in the structure of blood-corpuscles, insects' cornea, &c.—An important communication was read from Prof. Abbe, of Jena, announcing the construction of a new kind of glass, by which the secondary spectrum in objectives was eliminated. Two new objectives were exhibited, which were found to present a considerable advance upon those hitherto constructed.—Notes on a new mounting media of high refractive index, and on a process for obtaining diatoms, were read.—Mr. A. D. Michael read a paper on the life-history of an Acarus, one stage whereof is known as *Labidophorus talpæ*, Kramer, and on an unrecorded species of Disparipes. In 1877 Kramer described a creature which he found parasitic upon the mole, and treated as a new species, naming it as above; it resembled Koch's *Dermaleichus sciurinus;* it was, however, suspected that both were immature, hypopial forms. In 1879 Haller discovered the adult form of *D. sciurinus;* he found it upon the squirrel in considerable numbers and in all stages, Koch's supposed species being the hypopial nymph. For some years Mr. Michael has been trying to trace the history of Kramer's Labidophorus, which he frequently found on the mole, but which he could not get to thrive away from its host; less fortunate than Haller, he could not find on the mole any Acarus which could be the adult stage. Last December it struck him that he might succeed by getting the moles' nests; here he found adult males and females of what he thought might be the species; he also found immature Acari in the ordinary nymphal stage, which he suspected belonged to the same species. By keeping these in confinement and carefully watching them he was enabled actually to see the hypopial nymph, *Labidophorus talpæ*, emerge from the cast skin of the young ordinary nymph, and the adult males and females emerge from the cast skin of the fully-grown ordinary nymph. Mr. Michael proposes to call the species *Glyciphagus crameri.* It is a singular species, the males having remarkable comb-like longitudinal ridges under the front legs. Mr. Michael also described the life-history of a new Disparipes, to be called *D. exhamulatus.*

Anthropological Institute, March 9.—Mr. John Evans, F.R.S., Vice-President, in the chair.—The election of Maccullough Bey was announced.—Mr. Arthur J. Evans read a paper on the flint-knapper's art in Albania. During a recent journey through Epirus Mr. Evans was so fortunate as to observe, in a street of Joannina, an old Albanian flint-knapper practising his art, and described his method of working. The place where he obtained his flints is about two hours' journey from Joannina. The flints were mostly of tabular shape, scattered in profusion about the summit of a limestone plateau, but Mr. Evans was unable to discover any signs of their having been used for manufacture in ancient times. The strike-a-lights, as exposed for sale, are partially cased in ornamental lead sheaths studded with glass gems and otherwise adorned with something not unlike the ancient "honeysuckle" pattern. Compared with old English, French, and German forms, the Albanian flints show the peculiarity of being chipped on both faces instead of presenting one flat side, and they are fashioned with a minute care that recalls the beautifully even surface-chipping of Neolithic times.—The following communications were read by the Secretary:—Notes upon a few stone implements found in South Africa, by W. H. Penning, F.G.S.; and notes on some prehistoric finds in India, by Bruce Foote, F.G.S.—Dr. Garson exhibited and described Broca's stereograph and some other anthropometric instruments.

PARIS

Academy of Sciences, March 22.—M. Jurien de la Gravière, President, in the chair.—On the constitution of the earth's crust, by M. Faye. It is argued that the surface of the globe cools more rapidly and to a greater depth under the oceans than on the continents, because heat radiates more freely through liquid than through solid bodies. And as this discrepancy has existed for millions of years, the crust of the earth must now be denser under the waters than under dry land. Hence, in the pendulum observations and other calculations made relative to the figure of the globe, no account should be taken of the attraction of the continental masses lying above sea-level, this excess of matter being compensated lower down by a corresponding diminution of density. In the same way no account should be taken of the feeble attraction of the oceans, because this also is compensated a little lower down by the greater density of the solid crust under the oceanic basins. The same conclusion is pointed at by the now completed triangulation of India, Col. Clarke remarking that it would seem that these pendulum observations have established the fact (previously indicated by the astronomical observations of latitude in India) that there exists some unknown cause, or distribution of matter, which counteracts the attraction of the visible mountain masses.—On the flexion of prisms, by M. H. Resal. A source of error is detected and corrected in the memoir on the flexion of prisms published by M. de Saint-Venant in 1856, the last in which he occupied himself with the subject.—Description of an instrument intended to produce at pleasure an invariable quantity of electricity, by M. Marcel Deprez. This invention, which has already been successfully tested in several experiments conducted by M. Minet at Creil, has for its object the easy reproduction of the unit of electric quantity known by the name of *coulomb* at all times and under all conditions of temperature and pressure.—Account of a spherical absolute electrometer, by M. Lippmann.—Note on the poisons normally present in animal organisms, and particularly on those of the urine, by M. Ch. Bouchard.—On the development of a holomorphous function in a series of polynomes in any area, by M. P. Painlevé.—On the calorimetric study of metals at high temperatures, by M. Poinchon. In this paper the author continues the researches of Pouillet, Weber, and Violle, and here deals more especially with the common metals and some alloys of platina.—On effluvography, a method of obtaining images by effluvium, by M. D. Tommasi. The author submits the first results of his researches on a process for obtaining, by the sole action of electric effluvium, the effects realised by the employment of light in photography. His experiments tend to show that the effluvium produces the same effects as the ultra-violet rays, and that there must consequently exist a connection between the two extreme ends of the spectrum. This connection is constituted by what he provisionally calls *electric rays.*—On the separation and quantitative analysis of copper, cadmium, zinc, nickel, cobalt, manganese, and iron, by M. Ad. Carnot. Having already shown how copper may be separated from cadmium, and cadmium from zinc, by means of the hyposulphite of ammonia and soda, the author explains his process for separating zinc, nickel, or cobalt, manganese, and iron by means of sulphuretted hydrogen, the state of the liquids being modified by successive precipitation.—On the elements of sugar of milk in plants. In continuation of his previous paper the author shows that the mucous substances of plants, gums, pectine, mucilage, &c., contain galactose identical with that of the sugar of milk; and further, that these mucous substances exist in vegetable aliments in such quantities that they are able to furnish the galactose which enters into the constitution of the sugar of milk secreted by the mammary glands

of herbivorous animals.—On a new organ of sense in *Mesostoma lingua*, Osc. Schm., by M. Paul Hallez. The organ here described as a median ventral fosse would probably seem to be the seat of the sense of smell in these organisms.—Chlorophyll and the reduction of carbonic acid by plants, by M. C. Timiriazeff.—Note on some xylenic derivatives, by MM. Albert Colson and Henri Gautier.—On the oxidation of the acids of fatty substances, by M. H. Carette.—On a synthesis of the cyanide of ammonium by effluvium, by M. A. Figuier.—Fresh researches on the toxic or medicinal substances by which hæmoglobin is transformed to methæmoglobin, by M. Georges Hayem.—Description of the excreting apparatus and nervous system of *Duthiersia expansa*, Edm. Perrier, and of *Solanophorus megalocephalus*, Creplin, by M. J. Poirier.—On the selenides of potassium and of sodium, by M. Charles Fabre. The formulas are given for the heat of formation and the heat of dissolution of these selenides.—On *Sigillaria Menardi*, in reply to the strictures of M. Weiss, by M. B. Renault.—On the disposition of the crystallised and archæan rocks in West Andalusia, by MM. Michel Lévy and J. Bergeron.—On the slope of the isothermal layers in the deep waters of the Lake of Geneva, which are shown to be inclined at an angle and not superimposed horizontally, as hitherto supposed, by M. F. A. Forel.—On the probable origin of earthquakes, by M. Ch. Lallemand. The author reverts to Elie de Beaumont's theory of a central fluid, which, in combination with Lowthian Green's more recent views on the chilling process ("Vestiges of the Molten Globe"), supplies, he thinks, an adequate explanation of all the underground phenomena and igneous eruptions.

Berlin

Physical Society, January 8.—Dr. Lummer had subjected De Lalande's element to an examination, and communicated some provisional results of this investigation. The element consisted of an iron vessel, the bottom of which was covered with peroxide of copper; the neck was closed by an india-rubber stopper, through which a zinc cylinder passed; the fluid with which it was filled was potash lye. The chemical process in the cell consisted in the formation of zincate of potassium (*Kaliumzinkat*) and of metallic copper. The electromotory force of the element was found to be equal to from 0·5 to 0·8 Daniell. In one case, however, there were two elements which appeared perfectly alike, one of which yet showed an electromotory force of 0·8 Daniell, the other of more than 1 Daniell, though no ground for this difference was perceptible. The internal resistance of the element was found to be equal to about 0·1 Siemens, and the intensity of the current, the external resistance being 1 Siemens, was about 1 Ampère. Permanently closed with 1 Siemens, the element kept the same intensity for six full days. If the element was exhausted, the passage of a vigorous current from the dynamo-machine sufficed, according to the statements of the discoverer, to completely restore the element. This, however, could only happen, as Prof. von Helmholtz set forth at large in the discussion following the address, when such strong currents were applied that the iron became passive, and only the copper again got oxidised.—Prof. Börnstein reported on the sleety squall which blew through Berlin on January 5, at 2.20 p.m. He laid before the Society the curves marked at that time by the registering apparatus of the Agricultural High School of Berlin. The barograph first showed a sudden rise of about 1mm. in the pressure of the atmosphere. The thermograph marked just as sudden a depression of temperature. The anemograph indicated a sudden increase in the strength of wind, and at the same time a shower of sleet fell to the earth. The same day, at about 11.30 a.m., a squall was observed in Hamburg, which also coincided with a sudden rise in the pressure of the atmosphere and diminution of temperature. It was hardly to be doubted that this was the same squall which reached Berlin at 2.20 p.m., and which accordingly had overtaken the distance from Hamburg to Berlin in about 2¾ hours. In regard to the nature of these squalls, the speaker set forth the theory that they represented the state of the atmosphere after the occurrence of a small minimum with ascending current of air. On the back of this minimum the air fell to the ground, and produced both sudden rise of pressure and abatement of temperature, seeing that the upper cold air descended with its icy precipitate. The most important phenomena of the squalls—increase in pressure and in the strength of the wind, decrease of temperature and the precipitates—were in this way very readily explained. The somewhat lengthy discussion with which this address was followed up dwelt on the necessity of quite precise determinations of the time of each particular phenomenon embraced in the course of such a squall, in order to be able to distinguish the primary from the secondary phenomena, as also on the necessity of exactness in respect of the barographs, both quicksilver and aneroid.

BOOKS AND PAMPHLETS RECEIVED

Books:—"Atlas de la Description Physique de la République Argentine;" Deuxième Section: Mammifères, by Dr. H. Burmeister (Buenos Aires).—"Calendar, Royal University of Ireland, 1886" (A. Thom).—"A Short Manual of Chemistry;" Vol. I. Inorganic Chemistry, by Dupré and Hake (Griffin).—"Burma," by J. G. Scott (Shway Yoe) (Redway).—"Upland and Meadow," by C. C. Abbott (Low).—"Manual of Surgery," 3 vols., edited by F. Treves (Cassell).—"Electricity," by L. Cumming (Rivingtons).—"Observations of the Southern Nebulæ made with the Great Melbourne Telescope from 1869 to 1885," Part I., by R. L. J. Ellery (Ferres, Melbourne).—"Mineral Resources of the United States 1883-84," by A. W. Williams, Jun. (Washington).—"The Fisheries and Fishery Industries of the United States;" Section I. Text and Plates, 2 Vols., by G. B. Goode (Washington).—"A Catalogue of the Library of the Chemical Society" (Harrison).—"Report of the Commissioner of Education, 1883-84" (Washington).—"The Cornell University Register, 1885-86" (Ithaca, N.Y.).—"A Treatise on Nature," by H. Collins (White).—"Euclid Revised," by R. C. J. Nixon (Clarendon Press).—Pamphlets:—"A New Graphic Analysis of the Kinematics of Mechanisms," by Prof. R. H. Smith.—"Die Ursache der Secularen Verschiebungen der Strandlinie," by Dr. F. Lörol (Prag).—"Goître in the Himalayas," by W. Curran (Falconer, Dublin).—"Loss of Life and Property by Lightning at Home and Abroad," by W. McGregor (Robinson, Bedford).—"Report of Experiments on the Growth of Wheat," by Sir J. B. Lawes and J. H. Gilbert (Clowes).—"On the Valuation of Unexhausted Manures," by Sir J. B. Lawes and J. H. Gilbert (Murray).—"Experiments on Ensilage, Season 1884-85," by Sir J. B. Lawes and J. H. Gilbert (Harrison).—"Gyrating Bodies," by C. B. Warring.—"Liste Générale des Observatoires et des Astronomes, des Sociétés et des Revues Astronomiques," by A. Lancaster (Hayez, Bruxelles).

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